

In the Claims:

Please amend the claims as follows:

1. (previously amended) A method of tuning an arc welding system comprising an electric circuit including a power source, and a control system including computer means and memory means, the method comprising:

determining values of system input parameters of the electric circuit;

calculating tuning parameter values from these system input parameters by using a simulation model of the arc welding system; and

tuning the arc welding system by implementing the tuning parameter values into the control system,

wherein the simulation model is calibrated to represent the actual welding situation by measurement of model parameter values on the welding station on site.

2. (previously amended) A method according to claim 1, wherein the calibration comprises a first calibration mode comprising:

short-circuiting the electric circuit over the arc;

sending a controllable current and voltage through the system; and

measuring the resistances and the inductances of the electric circuit.

3. (currently amended) A method according to claim 1, wherein the calibration comprises a second calibration mode comprising:

empowering the welding station with full power to produce an arc;  
measuring the current and the voltage (45) of the electric circuit; and  
adjusting the model so that predicted values match the measured values.

4. (previously amended) A method according to claim 1, wherein the calibration comprises a third calibration mode comprising:

empowering the welding station with full power to produce an arc;  
performing a plurality of process modes by the control unit; and  
extracting the characteristic fingerprint pattern of the power source from measurement of current and voltage under each of the performed process modes.

5. (currently amended) A method according to claim 1, wherein the simulation model is brought to comprise a model component of the metal transport between the electrode and the workpiece, the metal transport model is brought to comprise a first model part of a region close to the wire, a second model part of the arc column, and a third model part of the metal condensing in the region close to the workpiece, the simulation model further comprising a model part of the power source used to generate the metal transport, and a model part of the electrical circuit connecting the wire, the arc column, and the workpiece and the power source together.

6-9 (cancelled)

10. (currently amended) ~~Computer~~ A computer program product comprising

a computer readable medium; and  
computer program instructions recorded on the computer readable medium and  
executable by to influence a processor to perform a method according to claim 1 to 5 of tuning  
an arc welding system comprising an electric circuit including a power source, and a control  
system including computer means and memory means, the method comprising determining  
values of system input parameters of the electric circuit, calculating tuning parameter values  
from these system input parameters by using a simulation model of the arc welding system, and  
tuning the arc welding system by implementing the tuning parameter values into the control  
system, wherein the simulation model is calibrated to represent the actual welding situation by  
measurement of model parameter values on the welding station on site.

11. (currently amended) The computer program product according to claim 10 provided at least in part over a network such as the Internet.

12. (currently amended) The computer program product according to claim 11, wherein  
the network comprises the internet. A computer readable medium containing a computer  
program according to claim 10.

13. (new) The method according to claim 1, wherein the simulation model comprises means for calibrating the simulation model, input means for receiving measured model parameter values, means for calculating tuning parameter values, and means for implementing the parameter values into a control system of a robotic arc-welding station representative of the simulation model.

14. (new) The method according to claim 5, wherein the model parameters of the electric circuit comprise inductance and resistance of a first electric path, inductance and resistance of a second electric path, current and voltage of a process mode, and a correspondent behavior of the power source.